PATENT SPECIFICATION

NO DRAWINGS

1,122,796

1,122,796

Date of Application and filing Complete Specification: 13 Oct., 1965.

No. 43417/65.

Application made in France (No. 991316) on 14 Oct., 1964.

Complete Specification Published: 7 Aug. 1968.

Index at acceptance: —A5 B(3, 4, 31); A5 R83L

Int. Cl.: —A 61 k 3/78

COMPLETE SPECIFICATION

Composition for Making a Coating on Human Tissue

I, GUSTAVE GIRARDIERE, a Citizen of the French Republic, of 13 Rue du Belvèdére, Boulogne-sur Seine (Seine) in France, do hereby declare the invention for which I, pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement: —

This invention relates to a composition for making a coating on human tissue. The expression "making a coating on human tissue" includes for example applying a medicament to wounded tissue.

For cutaneous application of active therapeutic or cosmetic substances, carriers have been used in liquid or aerosol form. These carriers have the disadvantage that they disappear rapidly, by rubbing or evaporation, and frequently necessitate the use of compresses or dressings. The action of the active substance is thus rapidly reduced since in most cases air causes their deterioration or destruction.

An object of the present invention is to provide an improved method of applying an active substance which is not readily destroyed in contact with the tissue.

According to this invention there is provided a composition for making a coating on human tissue so as to apply thereto an active substance, the composition comprising: —the active substance, a first solution of a water-soluble aliginate and a second solution of an appropriate metal salt which is capable of coagulating the alginate, such that when the solutions are separately applied to the tissue the alginate is coagulated to make the coating.

The active substance may be incorporated in the first solution or in the second. If the active substance is not incorporated in the alginate solution or the metal salt solution, it may be separately applied for example by spraying, painting, or by hypodermic injection. The active substances may be incorporated in a third solution.

It is known that sodium alginate reacts with some calcium salts, for example the chloride, to form a coagulated substance which can be put into the form of for example foam, filament, cotton wool, or gauze, and then utilized in that form.

In the method of the invention there can be used alginate of sodium, potassium ammonium, lithium, magnesium, triethanolamine or propylene glycol and an appropriate salt of a group II metal except magnesium, mercury and radium.

For example, an alginate of potassium will form a coating with strontium chloride. However, there is preferably used an aqueous solution containing between 2 and 4% by volume of sodium alginate and an aqueous solution containing about 1.5% by volume of calcium chloride.

Nitrogen or a Freon can be employed as a propellant gas, this gas being enclosed under pressure with the alignate or the metallic salt (either of which may contain the active substance) in a bottle with a nozzle. The nozzle produces a mist similar to an aerosol, but in which the small drops, in the case of the alginate, are of a size generally larger than 5 microns.

Better and more uniform coatings are obtained when a mixture of gases is utilized as a propulsion agent, the density of which mixture in the liquid phase is substantially the same as that of the substance to be vaporized. Thus in the use of sodium alginate in 3% aqueous solution having a specific gravity of 1.04, the propulsion agent is constituted by a mixture of dichlorodifluoro methane (Freon 12) ("Freon" is a Registered Trade Mark) having a specific gravity of 1.325 and pure butane having a

[Price 4s. 6d.]

specific gravity of 0.577, in proportion by volume of 62% Freon 12 to 38% pure butane. Atomization of this mixture provides fine, uniform droplets of sodium alginate solution, which result in the formation of a uniform layer.

As the active substance, there may be used therapeutic or cosmetic substances, for example antibiotics, cortisone, antiseptics, sulphonamides, microbic substances, for example bacilli or cocci, viruses, and other micro-organisms. Other active substances which can be used are organic tissue extracts, placentae extracts, vegetable extracts, finely divided vegetable substances, flower petals, vitamins, hormones, royal bee jelly, sea water, plankton, mineral water, beauty products, beauty masks, and capillary products.

Not only does the coating keep the active substance in intimate contact with the tissue or wound in a better and more convenient manner than with compresses, dressings, creams, and so on, but it also has the benefit of the advantages of the alginate, namely its slow diffusion and its haemostatic, cicatrizing and re-absorbent properties. In addition to its own action, or even without utlization of this action, the alginate can thus play the part of a means of administration of the active substance by cutaneous or trans-cutaneous methods.

Depending on circumstances that is according to the compatibility or incompatibility of the active substance, the latter may be applied separately over the tissue or wound to be treated, in which case it may be supplied from a separate aerosol or other vaporising bottle, or it may be mixed beforehand, either with the soluble alginate solution or with a solution of calcium chloride or other alginate coagulating metal salt.

Examples of the invention will now be described.

Example 1
Treatment of burns

Flask A	
Sodium alginate:	40 grams
Distilled water to make up:	1000 ml.
Flask B	
Neomycin:	0.15 grams
to be diluted in distilled water:	10 ml.
Flask C	
Calcium chloride:	15 grams
Distilled water, to make up:	1000 ml.

There is sprayed over the lesion a thin layer of the alginate solution of flask A. Half of the contents of flask B is then sprayed over the first layer, after which a further layer is made with flask A. The remainder of flask B is then sprayed on and a last layer is made with flask A. Finally, the whole is coagulated in order to obtain a coating, by means of a layer sprayed from flask C.

Depending on the nature of the wounds, the coating will eliminate itself or it can quite easily be removed. Any fragments which are not completely re-absorbed can be covered by a fresh coating.

Example 2
Treatment of dermatosis

Flask A	
Sodium alginate:	40 grams
Distilled water, to make up:	1000 ml.
Flask B	
Hydrocortisone acetate:	3.50 grams
Calcium chloride:	15 grams
Calcium pantothenate:	5 grams
Lactic acid, to make up to pH 4.5:	
Distilled water to make up:	1000 ml.

A thin layer of the contents of flask A is sprayed over the lesion followed by a layer of flask B. These operations are repeated three times.

Example 3
Treatment of burns and dermatosis

Flask A	
Sodium alginate:	40 grams
Distilled water, to make up:	1000 ml.
Flask B	
Di-isothionate of bis(amino-4'-phenoxy)-1.6-hexane	1 gram
Calcium chloride:	15 grams
Alcohol (30°) to make up:	1000 ml.

Using flask A, a layer of about 3 mm in thickness is sprayed over the lesion and this layer is coagulated by spraying with the contents of flask B.

Depending on the nature of the wounds, the coating obtained will eliminate itself or it may be very easily removed. Any fragments which are still not wholly re-absorbed may be covered by a fresh coating.

Example 4
Treatment of vaginitis and leucorrhea

Flask A	
DODERLEIN bacillus in pure culture:	50 millions
Sodium alginate:	25 grams
Distilled water, to make up:	1000 ml.
Flask B	
Lactic acid, to make up to pH=5.5	
Calcium chloride:	15 grams
Distilled water, to make up:	1000 ml.

Part of the contents of flask A is applied by spraying. The layer thus sprayed is coagulated by means of flask B. The DODERLEIN bacilli develop inside the coating of calcium alginate and thus act more effectively against the opposing micro-organisms.

EXAMPLE 5
Treatment of irritated, blotchy or sunburnt skin

Flask A

Apricot juice:	275 grams
Tomato juice:	350 grams
Carrot juice:	350 grams
Sodium alginate:	25 grams.

Flask B

Calcium chloride:	15 grams
Distilled water, to make up:	1000 ml.

The fruit juices are used as solvents for the sodium alginate. The alginate solution obtained is filtered, stabilized, and put into an aerosol flask with a "Freon" or nitrogen as the propellent gas. This preparation is sprayed on to the skin from the flask. A coating or mask is formed on the skin by coagulating this preparation by means of aerosol flask B containing the solution of 1.5% of calcium chloride. The mask is left on the skin at least 30 minutes.

EXAMPLE 6
Treatment for improving flabby and distended skin

Flask A

Juice of acid cherries:	290 grams
Strawberry juice:	585 grams
Finely divided wheat foundation:	100 grams
Sodium alginate:	25 grams
	1000 grams

Flask B

Calcium chloride:	15 grams
Distilled water, to make up:	1000 ml.

The fruit juices are employed as solvents for the sodium alginate. The alginate solution obtained is filtered, stabilized and put into an aerosol flask with a "Freon" or or nitrogen as the propellent gas.

This preparation is sprayed over the face from the flask. A coating or mask is formed by coagulating this preparation by spraying from aerosol flask B containing the 1.5% solution of calcium chloride. The mask is left on the skin at least 30 minutes.

EXAMPLE 7
Re-hydration treatment for dry skins

Flask A

Extract of fresh peach pulp:	275 grams
Extract of cucumber pulp:	400 grams
Extract of pineapple pulp:	300 grams
Sodium alginate:	25 grams.
	1000 grams

plus a sufficient quantity of stabilizing and anti-fermentation agent.

Flask B

Calcium chloride:	15 grams
Distilled water, to make up:	1000 ml.

This preparation is sprayed over the face from an aerosol flask, and the layer is coagulated to obtain a coating or mask by spraying from aerosol flask B containing a 1.5% solution of calcium chloride. The mask is left on the skin for from 30 minutes to two hours.

EXAMPLE 8
Treatment for removing wrinkles

Flask A

Mink oil:	30 grams
Sodium alginate:	25 grams
Distilled water and stabilizing agent, to make up:	1000 grams

Flask B

Calcium chloride:	15 grams
Distilled water, to make up:	1000 ml.

The oil is emulsified by the action of the sodium alginate. The solution obtained is filtered and stabilized and is then put into an aerosol flask with a "Freon" or nitrogen as the propellent gas. This solution is sprayed over the face. A coating or mask is formed by coagulating this preparation by spraying from the second aerosol flask B. The mask is left on the skin for at least 30 minutes.

EXAMPLE 9
Depilatory treatment

Flask A

Calcium sulphide:	80 grams
Sodium alginate:	25 grams
Distilled water, to make up:	1000 ml.

Flask B

Calcium chloride:	15 grams
Calcium hydrosulphide:	25 grams
Distilled water, to make up:	1000 ml.

A suspension of calcium sulphide is mixed little by little with the solution of sodium

alginate. No reaction is produced. This solution is sprayed on to the portion to be depilated, and the coating is coagulated by spraying from flask B.

The coating is left on the skin for from ten to thirty minutes.

EXAMPLE 10
Treatment for re-growth of hair

Flask A	
Neutral quinine sulphate:	15 grams
Emulsified lecithin:	60 grams
Sodium alginate:	25 grams
Distilled water, to make up:	1000 ml.
Flask B	
Spirit of juniperus oxycedrus:	300 grams
Calcium chloride:	15 grams
Distilled water, to make up:	1000 ml.

A layer about 3 mm. thick is sprayed over the place in which it is desired to ensure re-growth of hair, by spraying from the flask A. This preparation is coagulated by spraying from the flask B. The coating is left on the skin for at least two hours.

WHAT I CLAIM IS:—

1. A composition for making a coating on human tissue so as to apply thereto an active substance, the composition comprising the active substance, a first solution of a water-soluble alginate and a second solution of an appropriate metal salt which is capable of coagulating the alginate, such that when the solutions are separately applied to the tissue the alginate is coagulated to make the coating.

2. A composition according to claim 1 wherein the active substance is incorporated in the first solution.

3. A composition according to claim 1 wherein the active substance is incorporated in the second solution.

4. A composition according to claim 1 further comprising a third solution containing the active substance.

5. A composition according to any of claims 2 to 4 wherein the active substance is a medicament.

6. A composition according to any of claims 2 to 4 wherein the active substance is a cosmetic substance.

7. A composition according to any preceding claim wherein the alginate is selected from the alginates of sodium, potassium, lithium, magnesium, triethanol amine, and propylene glycol.

8. A composition according to any preceding claim wherein the metal salt is a metal of Group II of the Periodic table, except magnesium, mercury and radium.

9. A composition according to claim 7 wherein the first solution contains 2 to 4 grams sodium alginate to 100 ml. water.

10. A composition according to claim 8 wherein the second solution contains 1.5 grams calcium chloride to 100 ml. water.

11. A composition according to any of claims 1 to 4 wherein the active substance includes at least one of the following:— an antibiotic, an antiseptic, cortisone, bacilli, cocci, a sulphonamide, a vegetable extract, plankton, and a mineral water.

12. A composition according to any of claims 1 to 4 wherein the active substance includes at least one of the following:— a substance for treating flabby skin, a rehydrating agent, an anti-wrinkle agent, a depilatory agent, and a capillary agent.

13. A composition according to any preceding claim wherein the solutions are contained in separate aerosol flasks.

14. A composition substantially as herein described, with reference to any of the examples.

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Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1968.
Published by the Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.